SERIES 7700 Outdoor Lighting Controls

The Fisher Pierce Series 7700 photocontrol design incorporates an all-new electromagnetic relay (U.S. patent 5,132,596) which offers several key advantages over traditional designs. Its unique unitized design allows consistent performance and manufacture, while improving the ruggedness and durability of the photocontrol. This self-supporting unitized relay configuration effectively eliminates shock damage from shipping and handling. Units meet or exceed ANSI 136.10 1988 standards. Series 7700 controls are UL listed and CSA certified.

<table>
<thead>
<tr>
<th>(1) Model No.</th>
<th>(2) AC Voltage</th>
<th>(3) Load Rating</th>
<th>(4) Base Size</th>
<th>(5) Relay</th>
<th>Lightning Arrester</th>
<th>(6) Turn-on Turn-off</th>
</tr>
</thead>
<tbody>
<tr>
<td>7760-SSS</td>
<td>120</td>
<td>1000W/1800VA</td>
<td>3 1/4&quot;</td>
<td>N.C.</td>
<td>Expulsion</td>
<td>On 1 fc. nom. Off 3 fc. av.</td>
</tr>
<tr>
<td>7760-ESS</td>
<td>120</td>
<td>1000W/1800VA</td>
<td>3 1/4&quot;</td>
<td>N.C.</td>
<td>Deluxe</td>
<td>On 1 fc. nom. Off 3 fc. av.</td>
</tr>
<tr>
<td>7762-ESS</td>
<td>120</td>
<td>1000W/1800VA</td>
<td>3 1/4&quot;</td>
<td>N.C.</td>
<td>Deluxe</td>
<td>On 1 fc. nom. Off 3 fc. av.</td>
</tr>
<tr>
<td>7790B-SSS</td>
<td>105 to 265</td>
<td>1000W/1800VA</td>
<td>3 1/4&quot;</td>
<td>N.C.</td>
<td>Deluxe</td>
<td>On 1 fc. nom. Off 3 fc. av.</td>
</tr>
<tr>
<td>7790B-ESS</td>
<td>105 to 265</td>
<td>1000W/1800VA</td>
<td>3 1/4&quot;</td>
<td>N.C.</td>
<td>Deluxe</td>
<td>On 1 fc. nom. Off 3 fc. av.</td>
</tr>
</tbody>
</table>

NOTE (1) For additional options refer to Bulletin FP074.
NOTE (2) For higher load ratings see multiple relays.
NOTE (3) Many non-standard turn-on and turn-off ratios are available for special applications, i.e. tunnels, etc.

SERIES 281 “Energy Saver”

The Fisher Pierce Series 281 Outdoor Lighting Timing Adapter will automatically turn off photoelectrically controlled outdoor light sources at a preset number of hours after sundown. Specifically designed for highway and street lighting applications, the Series 281 is also suitable for use in commercial, institutional and industrial areas. Units are also available with a morning turn-on feature as described in bulletin OE-115R.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Input voltage (VAC)</th>
<th>Burning Time/Night</th>
</tr>
</thead>
<tbody>
<tr>
<td>281C-1</td>
<td>120</td>
<td>3, 4, 5, 6, or 7 hours</td>
</tr>
<tr>
<td>281M-2</td>
<td>240</td>
<td></td>
</tr>
<tr>
<td>281B-3</td>
<td>277</td>
<td></td>
</tr>
<tr>
<td>281Y-4</td>
<td>480</td>
<td></td>
</tr>
</tbody>
</table>

Receptacle Caps

Receptacle caps are for use on twist-lock multiple relays and luminaries where it is desirable to either maintain or interrupt circuit continuity when the photocontrol is not in use. All units are outdoor weatherproof and gasketed to ensure receptacle integrity.

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1038-1</td>
<td>Shorting Cap</td>
</tr>
<tr>
<td>S1038-2</td>
<td>Shorting Cap &amp; Lightning Arrester</td>
</tr>
<tr>
<td>S1038-3</td>
<td>Non-Shorting Cap</td>
</tr>
<tr>
<td>S1038-7</td>
<td>Open Cap with 160j MOV Arrester*</td>
</tr>
<tr>
<td>S1038-8</td>
<td>Shorting Cap with 160j MOV Arrester*</td>
</tr>
</tbody>
</table>

*Note: Units with MOV arresters must not be applied where voltages can exceed 280 Vrms.
Series 7700 Electromagnetic Relay Outdoor Lighting Control

A Proven Standard of Performance
- Completely Redesigned Electromagnetic Relay Control for the 1990's.
- Produced by Automation.
- Tight Operating Tolerances.
- Rugged Construction.
- Increased Contact Life.
- High Reliability.
- 7790B Multi-Voltage Control
- Made in the U.S.A.

The Fisher Pierce 7700 Series Outdoor Lighting Control combines a history of reliable performance with the design and manufacturing techniques of the 1990's. Capitalizing on over 40 years of experience in the manufacture of instant-response, electromagnetic relay operated photoelectric controls, Fisher Pierce has completely re-engineered the photocontrol concept, as well as designed and installed a state-of-the-art automation system for manufacturing these advanced outdoor lighting controls. The superior performance of the Fisher Pierce Series 7700 photocontrol places it a step above all other controls on the market today.

To fully evaluate the 7700 photocontrol, a thorough test program was successfully completed. This program encompassed design and life tests well above current ANSI C136.10 1988 standards. Individual components and assemblies were carefully analyzed for manufacturability and repeatability.

In addition, pilot production units were tested and evaluated by selected utility customers. Over 6,000 controls were field tested at the most severe application sites by 40 utilities. Utilizing the feedback from these 40 utilities, this concurrent engineering project, which commenced in April 1990, confirmed that the Fisher Pierce Series 7700 photocontrol mean time to failure is improved by a factor of approximately 5 times that of competitive photocontrols. As of the date of publication of this brochure, 10.5 million Series 7700 controls are in service.

The Series 7790B multivoltage photocontrol circuit design has been modified, resulting in a 50% reduction in control power and improved operation performance over its entire voltage range (U.S. patent pending).

Electromagnetic Relay Design
The Series 7700 photocontrol design incorporates an electromagnetic relay (U.S. patent 5,132,596) which offers several key advantages over traditional designs. Its unique unitized design assures consistent performance and manufacture, while improving the ruggedness and durability of the photocontrol. This self-supporting unitized relay configuration effectively eliminates shock damage from shipping and handling.

The relay design also assures very precise adjustment of the relay contact gap and armature gap, significantly reducing relay contact bounce, chatter or hum. Relay operating characteristics are determined through adjustment of the relay yoke and magnetic core assembly by a computerized vision control system. Contact adjustment is precise and does not require manual bending and deformation of contact brackets — a common practice in other photocontrol designs. A single precise coil spring is used in place of the parallel flat springs common on most photocontrol relays to improve ruggedness, and provide consistent contact force.

Cadmium Sulfide Photocell
Series 7700 outdoor lighting controls utilize specially processed cadmium sulfide photocells developed exclusively for photocontrol applications. All Fisher Pierce photocells are produced utilizing our own highly automated cell manufacturing facility. Gold/platinum electrodes and high temperature firing in a nitrogen atmosphere assure a long stable cell life.

The Series 7700 standard, surface passivated photocell has proven to be more than adequate for the vast majority of installation.

An optional, polycarbonate, hermetically sealed photocell (MIL-STD-202D, Method 112A, Test Condition B) is available for use in adverse environments where high concentration of airborne contaminants are present.
**Construction**

Each Series 7700 photoelectric control is constructed on a 3" wide heat-resistant thermoplastic base. This advanced UL-recognized material is highly stable, rugged, and durable. The wide cross-linked polyethylene gasket assures moisture-proof sealing with the receptacle. All Fisher Pierce photocontrols are equipped with solid brass contact legs for positive socket mounting and cool, trouble free operation.

Load current transfer between the photocontrol terminals and the internal operating components is made directly. Most low current internal connections are made through the use of special, snap fit connectors to improve durability, consistency and quality. Manual soldering and riveting operations are minimized.

**Housing**

Standard Series 7700 controls utilize durable, easy to handle ANSI color-coded polypropylene housings, which offer high impact strength and excellent ultraviolet resistance. A clear, UV-stabilized window allows directional (north oriented) viewing. These housings provide flame retardance and impact resistance in full compliance with UL and CSA requirements. An integral barrier for the standard open-type arrester prevents damage to the relay and photocell from flashover outgassing or debris resulting from lightning arrester/surge suppressor operations.

Also available is the Fisher Pierce Sky Scanner™ omnidirectional, translucent housing, with zenith sensing, which may be desirable in applications where high ambient light levels or unusual light patterns adversely affect conventional north-oriented controls.

**Surge Arresters**

Luminaire and photocontrol life is greatly extended through protection provided by surge arresters. Fisher Pierce offers several types of surge arresters, which can be specified dependent on the protection requirements of the application.

a) **Standard Arrester** — An open type expulsion arrester design which meets all ANSI requirements, for use in light to medium duty requirements. Specify arrester option "S".

b) **Deluxe Arrester** — The industry standard in photocontrol surge protection, this expulsion design exceeds all ANSI requirements. The enclosed arrester design provides tightly controlled voltage spark-over, power follow current limiting, and arc quenching from Delrin® insulator outgassing/vented blow-out. Specify arrester option "E".

c) **Deluxe Arrester (Special Wiring Configuration)** — For applications where very high isokuronic levels exist, the special wiring configuration limits the maximum voltage across the coil and photocell. This option is available only with the deluxe arrester.

d) **MOV Surge Suppressors** — 160 joule metal oxide varistor (MOV) surge suppressors are also available when specified. Please consult factory for further information.

**Time Delay Option**

A time delay option is available for the basic 120V and 240V Series 7700 designs. This special feature prevents false lamp turn off from transient light; yet allows the control to be "glove tested" instantaneously during daylight hours (unlike thermal photocontrols). To specify the time delay option on Series 7760 and Series 7770 controls, add the suffix “TD” to the catalog number. Consult factory for time delay test method.

**Quality Control**

Every aspect of the Series 7700 photocontrol manufacturing process is performed under the strict supervision of the Fisher Pierce Quality Assurance Department. Inspection and test procedures include:

- Incoming inspection of all raw materials and components.
- Statistical Process Control (SPC) of all key product or process characteristics ensures “parts per million” quality levels.
- Automatic testing and computer-aided grading of each photocell which ensures accurate, stable operation.
- Final electrical testing and visual inspection prior to packaging, including automated calibration and testing for turn-on, turn-off, and differential.

Computer printout of production calibration and test results provides comprehensive documentation of conformance to your requirements.

Also available is the Fisher Pierce Sky Scanner™ omnidirectional, translucent housing, with zenith sensing, which may be desirable in applications where high ambient light levels or unusual light patterns adversely affect conventional north-oriented controls.
Specifications

**RATED VOLTAGE**

- **7760 Series**: 105-130V, 50/60Hz AC (120V Nominal)
- **7762 Series**: 105-130V, 50/60Hz AC (120V Nominal)*
- **7770 Series**: 200-300V, 50/60Hz AC (240V Nominal)
- **7772 Series**: 200-300V, 50/60Hz AC (240V Nominal)
- **7790B Series**: 105-265V, 50/60Hz AC (multivoltage)*
- **7792B Series**: 105-265V, 50/60Hz AC (multivoltage)*
- **7793 Series**: 250-400V, 50/60Hz AC (340V Nominal)
- **7794 Series**: 400-550V, 50/60Hz AC (480V Nominal)

*unit includes deluxe arrester with special wiring configuration

**RATED LOAD**

- 1000W/1800VA max., SPST, N.C.
- 100W Incandescent Load
- 1800VA Mercury Vapor, High Pressure Sodium or Other H.I.D. Load

**RATED LIFE**

- 5000 ON/OFF operations minimum at rated load

**POWER CONSUMPTION**

- **7760 or 7762 Series**: 1.6W max./0.8W avg. at 120V AC
- **7770 or 7772 Series**: 1.2W max./0.6W avg. at 240V AC
- **7790B or 7792B Series** (multivolt): 4.0W max./2.0W avg. at 240V AC
- **7793 Series**: 3.0W max./1.5W avg. at 350V AC
- **7794 Series**: 3.2W max./1.6W avg. at 480V AC

**STANDARD OPERATING LEVELS**

- **Turn-On**: 1 fc nominal
- **Turn-Off**: 3X Turn-On (Avg.)

**DIELECTRIC STRENGTH**

- 5KV minimum between any current carrying part and grounded metal mounting surface

**SURGE ARRESTER CHARACTERISTICS**

- **Standard (open type) Design**: 2.5KV, 5000A Follow-through capability
- **Deluxe (enclosed type) Design**: 2.0KV, 10000A Follow-through capability
- **Deluxe (enclosed type) Design** Special Wiring Config.: 2.0KV, 10000A Follow-through capability
- **Metal Oxide Varistor (MOV)**: 160 Joule; 320V

**ENVIRONMENTAL WITHSTAND CAPABILITY**

- **Ambient Temperature**: -40°C to +70°C (-40°F to +158°F)
- **Humidity**: 98% relative humidity for 168 hours at 50°C

**HOUSING COLOR CODING (per ANSI C136.10-1988)**

- **7750 and 7762 (120V Nominal)**: Gray
- **7770 and 7772 (240V Nominal)**: Maroon
- **7790B and 7792B (multivoltage)**: Dark Blue
- **7793 (350V Nominal)**: Green
- **7794 (480V Nominal)**: Yellow

**HOUSING**

- North-oriented: UV stabilized polypropylene.
- Zenith facing, pointed top: UV stabilized polymer.

**BASE**

- Heat resistant thermoplastic (3" dia.)

**WEIGHT**

- **Net each**: Approx. 7 oz. gross
- **Shipped each**: Approx. 11 oz. gross

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**Light Units and Conversions**

### Luminance

Brightness of a light source or reflecting surface.

- Concentrated source: A 1 candela (cd) source produces 1 footcandle (fc) at a distance of 1 foot.
- Extended source: The luminous intensity is expressed as candela per unit surface area.

### Illuminance

Intensity of light falling on a surface.

1 footcandle (fc) = 1 lumen (lm)/square foot (ft²).

1 lm/square meter (m²) = 1.0 lux (lx)

1 fc = 10.76 lx

<table>
<thead>
<tr>
<th>Examples of Illuminance</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct sunlight</td>
<td>10,000 fc</td>
</tr>
<tr>
<td>Facing away from sun</td>
<td>1,000 fc</td>
</tr>
<tr>
<td>Overcast day</td>
<td>100 fc</td>
</tr>
<tr>
<td>Average desktop</td>
<td>50 fc</td>
</tr>
<tr>
<td>Ability to read newspaper</td>
<td>5 fc</td>
</tr>
<tr>
<td>Twilight</td>
<td>1.0 fc</td>
</tr>
<tr>
<td>Full moon</td>
<td>0.01 fc</td>
</tr>
<tr>
<td>Starlight</td>
<td>0.0001 fc</td>
</tr>
</tbody>
</table>
Installation Instructions and External Connection Diagram

Fisher Pierce photoelectric outdoor lighting controls are packaged individually in specially designed cartons. Controls may be installed immediately upon removal from shipping cartons.

The receptacle (socket) may be connected to the system after all voltages have been disconnected, according to the accompanying wiring diagram, noting the system voltage and configuration. See NOTE below. To install the control, firmly place it into the socket and twist it clockwise until it locks in place.

Standard housing: Mount the control with the clear window facing north as indicated by the arrow on the cover. Repositioning to avoid pointing the cell toward artificial light is recommended. To confirm proper control installation during daylight hours, cover the window completely to simulate darkness. Control should switch on within 1 to 2 seconds.

For translucent omnidirectional Sky Scanner™ housing, special directional positioning is not required. To confirm proper control installation, cover the entire control to simulate darkness. Control should switch on within 1 to 2 seconds.

NOTE: Wiring diagram shown is for reference purpose only. Check applicable national and local codes prior to photocontrol and receptacle installation.
Ordering Information

To order a Series 7700 Control, specify a code number for each of the following:


An example of a correctly specified unit is shown below.

Specifications subject to change without notice.

The 7762, 7772 and 7792B are manufactured with deluxe type expulsion arrester only, and are wired for additional control protection.